MIDDLE FORK RESERVOIR

Wayne County

2004 Fish Management Report

Christopher C. Long

Assistant Fisheries Biologist

FISHERIES SECTION
INDIANA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
I.G.C. South, Room W273
402 W. Washington Street
Indianapolis, Indiana 46204

2006

EXECUTIVE SUMMARY

- Middle Fork Reservoir is a 177-acre water supply impoundment located in Richmond, Indiana.

- A fishery survey was conducted June 7 to 9, 2004 to evaluate the predator/prey balance, determine age and growth of the dominant sport fish, and evaluate panfish recruitment.

- A total of 1,941 fish representing 13 species was collected with an estimated weight of 913 lbs. The three most abundant species collected by number were white crappie (1,080), bluegill (467), and largemouth bass (156). The three most abundant species collected by weight were largemouth bass (227 lbs), common carp (217 lbs), and white crappie (159 lbs).

- White crappie ranged in length from 5.1 to 14.1 in and averaged 6.8 in. Approximately 99% of the white crappie were 6 to 8 in and were ages 2 and 3.

- Bluegill ranged in length from 1.6 to 8.8 in and averaged 6.0 in. Fifty-eight percent of the bluegill collected were harvestable size (greater than or equal to 6 in).

- Largemouth bass ranged in length from 3.8 to 21.1 in and averaged 13.3 in. Sixty percent of the largemouth bass collected met or exceeded the 14-in minimum length limit.

- Channel catfish ranged in size from 8.2 to 25.5 in. Seventy-four percent of catfish were over 12 in and considered harvestable size. The largest channel catfish weighed approximately 7 lbs. Natural reproduction is evident, therefore supplemental stockings are not recommended.

- As the 2001 and 2002 year classes of white crappie continue to grow and reproduce, the populations of largemouth bass and bluegill need to be monitored to ensure satisfactory growth and recruitment. The next fisheries survey is scheduled for 2006.

INTRODUCTION

Middle Fork Reservoir is a 177-acre impoundment located in Richmond, Indiana. The lake was built in the early 1960's as a water supply reservoir for the city. The Richmond Department of Parks and Recreation leases the lake along with 350 acres of surrounding land. A $3.75 fee is required to launch a boat at Middle Fork Reservoir.

Fisheries managers can utilize few management strategies other than fish stockings and fishing regulations since Middle Fork Reservoir is used as a potable water supply. Management options such as drawdowns and the use of fish toxicants are prohibited. Statewide size and creel limits apply for largemouth bass, redear sunfish, white crappie, and channel catfish at Middle Fork Reservoir.

In both 2000 and 2002, largemouth bass was the most abundant species collected at Middle Fork Reservoir. The expansion of the largemouth bass population led to increased predation on crappie and bluegill. As a result, bluegill and crappie growth and size structure were good.

The goal of the 2004 fisheries survey at Middle Fork Reservoir was to describe the predator/prey balance, determine age and growth of the dominant sport fish, and evaluate panfish recruitment.

METHODS

The survey was conducted from June 7 to 9, 2004. Physical and chemical characteristics were collected for water quality and measured in the deepest area of the lake according to the Manual of Fisheries Survey Methods (Shipman, 2001). Submersed aquatic vegetation was sampled on August 2, 2004, using guidelines written by Pearson (2004).

Fish were collected using three sampling gears. Pulsed DC night shoreline electrofishing was conducted for 1.0 h with two dippers. Four trap nets and eight experimental-mesh gill nets were also fished overnight. All fish collected were measured to the nearest 0.1 in TL. Average weights for Fish Management District 5, or length-weight regressions were used to estimate the weight of all fish collected. Scales were taken from largemouth bass, bluegill, and white crappie for age and growth analysis. Proportional stock density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). The Bluegill Fishing Potential Index (BGFP),

developed by Ball and Tousignant, 1996, was utilized to describe the bluegill fishing opportunities at Middle Fork Reservoir.

RESULTS

The water temperature at Middle Fork Reservoir on June 7, 2004 was 69.1ºF at the surface and 62.2ºF at 34 ft. Alkalinity was 119.7 mg/L at both the surface and 34 ft. The pH was 8.0 at the surface and 9.0 at 34 ft. Conductivity was 370 µS and the Secchi disk reading was 3.5 ft.

Four species of submergent vegetation were collected. The most abundant was American pondweed followed by leafy pondweed, sago pondweed, and elodea species. All were found to a maximum depth of 5 ft. The mean rake score for all sampling locations was 0.13 and the maximum number of species found per site was two. Non-submergent vegetation observed included cattails, filamentous algae, and water willow.

Altogether, 1,941 fish representing 13 species were collected with an estimated weight of 913 lbs. The three most abundant species collected by number were white crappie (56%), bluegill (24%), and largemouth bass (8%). The three most abundant species collected by weight were largemouth bass (25%), common carp (24%), and white crappie (17%).

A total of 1,080 white crappie was collected that weighed 159 lbs. Relative abundance (56%) increased substantially since 2002 when white crappie accounted for only 14% of the sample. The catch rate (CPUE) of white crappie was 70.3/gill net lift and 86.0/trap net lift. Electrofishing yielded a CPUE of 174.0 crappie/h. White crappie ranged in length from 5.1 to 14.1 in and averaged 6.8 in. Approximately 99% of the white crappie were ages 2 and 3 and ranged from 6 to 8 in in length. However, no age-1 crappie were collected. Crappie growth was well below average for central Indiana and has decreased almost 2 in at ages 2 and 3 since 2002.

A total of 467 bluegill that weighed roughly 78 lbs was collected. Bluegill was the second most abundant species collected by number (24%) and the fifth most abundant by weight (9%). Electrofishing yielded a CPUE of 227.0 bluegill/h. Bluegill ranged in length from 1.6 to 8.8 in and averaged 6.0 in. Fifty-eight percent of the bluegill collected were greater than 6 in, which was up from 45% in 2002. However, the proportion of bluegill larger than 8 in fell from 27% in 2002 to 3% in 2004. Bluegill PSD was 38. The BGFP score was 22 which qualifies the bluegill fishery as good. Overall, bluegill growth was average compared to other lakes in central

Indiana and showed little variation since 2002. The 2001 year class was dominant as age-3 bluegill accounted for about half of the total collection. Combined, ages 1 and 2 bluegill made up less than 10% of the total number of bluegill collected.

Largemouth bass was third in abundance by number (8%) and first by weight (25%). There were 156 largemouth bass weighing 227 lbs collected. Electrofishing yielded a CPUE of 149.0 bass/h. Largemouth bass ranged in length from 3.8 to 21.1 in and averaged 13.3 in. Sixty percent of the largemouth bass met or exceeded the 14-in minimum length limit. Largemouth bass PSD was 69. Overall, growth of largemouth bass is average and was similar to what was observed in 2002. Largemouth bass are reaching 14 in in approximately 5 years.

Thirty-nine common carp that weighed 217 lbs were collected. Carp ranked second in abundance by weight (24%). The largest carp collected was 33.1 in long with an estimated weight of nearly 17 lbs.

Overall, 27 channel catfish were collected that weighed 31 lbs. Channel catfish ranged in length from 8.2 to 25.5 in. Approximately 74% of channel catfish were over 12 in. The largest channel catfish weighed nearly 7 lbs. Additionally, 22 black bullheads that weighed 31 lbs were collected. Black bullheads ranged in length from 11.3 to 16.9 in and averaged 13.2 in.

Other species collected were white sucker, golden redhorse, golden shiner, pumpkinseed, green sunfish, redear sunfish, and longear sunfish. Together these species comprised 8% of the sample by number and 19% by weight.

DISCUSSION

Crappie populations have a tendency to be cyclic; meaning fluctuations between periods of low abundance and large size, and high abundance and smaller size, are common. In 2004, it appeared that the white crappie population was at or near peak abundance. White crappie increased in abundance from 14% in 2002 to 56% in 2004. Additionally, over 99% of the crappie were either age 2 or 3 and the average size fish was less than 7 in.

The dramatic increase in crappie abundance led to more competition for food and space amongst crappie and between crappie, bluegill, and largemouth bass. This likely caused the decline in crappie growth. Between 2002 and 2004, the average size of crappie at age 2 declined from 7.3 to 5.6 in and at age 3 from 9.5 to 7.2 in. Recruitment of crappie, bluegill, and largemouth bass appears to have also suffered because of increased competition. None of these

species were well represented by a 2003 year class. This is not surprising for bluegill because age-1 bluegill are often too small to be sampled effectively. However, age-2 bluegill were also poorly represented in the survey. If competition remains high amongst these three species, their recruitment will likely continue to suffer, the growth of crappie will remain poor, and bluegill and bass growth will likely slow significantly.

Hopefully crappie hold true to their cyclic pattern and do not produce any extraordinarily large year classes for several years. This coupled with natural mortality and harvest of the 2001 and 2002-year classes of crappie should reduce competition. As a result, largemouth bass and bluegill recruitment should improve, allowing their populations to grow. Added predatory pressure from an expanding bass population should also help maintain healthy populations of panfish. The next fisheries survey should be conducted in 2006. The survey will focus on determining the impact the abundant white crappie population has had on the fishery, specifically the growth and recruitment of largemouth bass and bluegill.

Crappie fishing should be good in the near future and anglers are encouraged to target and harvest them. Bass fishing should also be good as a large proportion were at least 14 in long. However, anglers are encouraged to practice catch and release for largemouth to help sustain their numbers until recruitment improves.

Twenty-seven channel catfish were collected in 2004 compared to only four in 2002, and many of these fish (74%) were more than 12 in long. Channel catfish have not been stocked since 1997 but natural reproduction is sustaining the population. Additionally, black bullheads are providing a significant contribution to the catfish fishery with fish up to at least 17 in obtainable. Since successful recruitment of channel catfish and black bullheads is occurring and quality-sized catfish are available to anglers, supplemental stocking of channel catfish is not recommended.

RECOMMENDATIONS

- The fishery should be resampled in 2006 to evaluate the predator/prey balance, age, growth, and recruitment of the dominant sportfish.

LITERATURE CITED

Anderson, R.O. and R.M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B.R. Murphy and D.W. Willis, editors. Fisheries Techniques 2nd edition. American Fisheries Society, Bethesda, Maryland.

Ball, R.L. and J.N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds. Research report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18 pp.

Pearson, J. 2004. A proposed sampling method to assess occurrence, abundance and distribution of submersed aquatic plants in Indiana lakes. Indiana Department of Natural Resources. Indianapolis, Indiana. 37 pp.

Shipman, S.T. 2001. Manual of fisheries survey methods. Indiana Department of Natural Resources. Division of Fish and Wildlife. Indianapolis, Indiana. 58 pp.

Submitted by: Christopher C. Long, Assistant Fisheries Biologist
Date: March 14, 2006

Approved by: J. Rhett Wisener, Fisheries Biologist

Approved by: _____
Brian M. Schoenung, Fisheries Supervisor
Date: March 21, 2006